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ABSTRACT

At the request of the Air Force School of Aviation Medicine, a project was initiated to evaluate the current screening process used for entry into three medical technical training courses: Aeromedical Specialist, Environmental Health Specialist, and Physiological Training Specialist. A sample of 1,003 students were administered the General Aptitude Index of the Armed Services Vocational Aptitude Battery (ASVAB); the Otis-Lennon Mental Ability Test; the vocabulary portion of the Word Clue Tests; and the reading speed and comprehension measures of the Appraisal of Reading Versatility, Advanced Test. Identification data and criterion data from the class rosters supplied additional biographical data on each trainee. Three models were developed from these predictor variables. Model 1 contained all test and biographical data. Model 2 contained only the data from the commercial tests. Model 3 contained only data from the ASVAB and the biographical data. It was concluded that Model 1 was the most useful in identifying potential failures and personnel requiring remedial training in medical technical courses. The significant contribution of the commercial tests to the predictor composite warrants their retention in the selection composite even though their use entails an additional expense. (Author/EB)

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AIR FORCE HUMAN RESOURCES LABORATORY

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DEVELOPMENT OF A SCREENING METHODOLOGY FOR ENTRY INTO MEDICAL TECHNICAL TRAINING COURSES

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By

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Brooks Air Force Base, Texas 78235

August 1977
Final Report for Period October 1975 – April 1977

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This final report was submitted by Personnel Research Division, under project AMDS, with HQ Air Force Human Resources Laboratory (AFSC), Brooks Air Force Base, Texas 78235. Sr.A. Sandra A. Leisey, Demographic and Attitudinal Research Branch, was the principal investigator.

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This research reports the evaluation of a current screening methodology and the feasibility of developing a refined selection methodology for entry into three medical technical training courses: Aeromedical Specialist (90130), Environment Health Specialist (90730), and Physiological Training Specialist (91130). A sample of 1,003 students who entered these courses during the 1973–1975 time period were administered three commercial tests by the USAF School of Aviation Medicine (SAM). Aptitudinal and biographical data were retrieved from historical record files. Multiple linear regression analyses were accomplished to determine whether the commercial tests and/or aptitudinal and biographical data contributed to the prediction of training performance. It was found that the most effective predictor composite contained both the commercial tests and the aptitudinal and biographical data. Results

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indicated that such a predictor composite can help in identifying potential failures and/or personnel requiring remedial training in these courses.

PREFACE

The research reported in this study was accomplished under project AMDS, Personnel Selection and Retention for Optimal Productivity; task AMDS10, AMD Attrition Study.

Special appreciation is expressed to Dr. L.N. Kromminga, USAF School of Aviation Medicine (USAFSAM/EDS) for his assistance in providing data needed to accomplish analyses for this project.

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DEVELOPMENT OF A SCREENING METHODOLOGY FOR ENTRY INTO MEDICAL TECHNICAL TRAINING COURSES

I. INTRODUCTION

Every selection and classification program has one major objective: to identify personnel who are most likely to succeed on the job. The Air Force is no exception. The stringent budgetary limitations imposed by Congress on military spending have called for more attention and emphasis than ever before to be placed on the armed services to find ways of maximizing the return on their training investment. Hiring or training personnel who will later terminate employment or training as a result of unsuccessful or non-adaptive performance represents a cost which might be minimized if more precise procedures could be developed to identify those individuals not likely to succeed at a later date.

Over the past few years, management personnel associated with technical training in the USAF School of Aviation Medicine (SAM), Brooks AFB, Texas, have noted a gradual rise in attrition rates. As a result, course managers have voiced their concern over the magnitude of the attrition rate in certain courses and have indicated a need to explore ways to reduce this rate by the development of refined selection procedures. At the request of USAF/SAM, a project was initiated to evaluate the current screening process used for entry into three medical technical training courses: 90130, Aeromedical Specialist; 90730, Environmental Health Specialist; and 91130, Physiological Training Specialist. The operational aptitude prerequisite for these courses is a minimum percentile score of 60 on the General Aptitude Index of the Armed Services Vocational Aptitude Battery (ASVAB). In addition to this initial screening, three additional commercial tests are being administered to all student trainees by USAF/SAM personnel on an experimental basis.

The primary purpose of this investigation was to develop a screening methodology which would identify potential failures and/or students requiring remedial training. It was anticipated that improved screening would result in a lower attrition rate where students not likely to succeed in training could be diverted to other specialty areas and/or students with learning problems might be identified for remedial training in an early enough phase of the training program to prevent academic failures. Specific objectives of the study were (a) to assess the value of the experimental screening used by USAF/SAM, and (b) to determine whether additional background and aptitudinal data might increase the effectiveness of the screening procedure.

II. METHOD

The sample population originally consisted of 1,200 students who entered courses 5ABY90130, Aeromedical Specialist; 5ABY90730, Environmental Health Specialist; and 5ABY91130, Physiological Training Specialist, during the 1973–1975 time period. Class rosters containing experimental test scores and criterion data on technical training performance were furnished by USAF/SAM. Criterion data in technical training included type of eliminee, phase test scores, and final school grade (FSG).

Experimental tests administered by USAF/SAM personnel to entering students provided a deviation intelligence quotient score (IQ) from the Otis-Lennon Mental Ability Test (Otis & Lennon, 1967), vocabulary score (VOCAB) from the Word Clue Test (Taylor, Franchenpohl & McDonald, 1962), and two reading ability scores, words per minute (WPM) and comprehension (COMP) from the Appraisal of Reading Versatility-Advanced Test (McDonald & Zimmey, 1962). Scores from these tests are used to identify students with academic problems and/or potential failures.

Identification data, test scores, and criterion data from the class rosters were keypunched and match/merged with historical data tape files (maintained by the Computational Sciences Division, Air Force Human Resources Laboratory [AFHRL] Brooks AFB, Texas) to obtain additional aptitudinal and biographical data on each trainee.

In combining the two data files, it was found that test scores were missing for 197 cases. These cases were dropped from the total sample reducing the total number of cases to 1,003 (see Table 1).

Table 1. **Sample Population**

Course	Type Eliminee				
	Graduates	Acad	Med	SIE	Total
90130	338	17	5	4	364
90730	296	26	2	4	328
91130	273	22	14	2	311
Total	907	65	21	10	1,003

The use of a pass/fail criterion in the analyses was difficult due to the small number of eliminees in each course. Adding to the difficulty was the fact that eliminees were not a homogeneous group since the eliminee group contained three main types: academic (ACAD), medical (MED), and self-initiated (SIE). To alleviate the criterion problem, other performance criteria were generated for analysis purposes. These criterion variables included Test Grade I, FSG, and Test Grades I and II Composite in addition to the pass/fail criterion.

A description of predictor and criterion variables is contained in Table 2.

Multiple linear regression analyses (Bottenberg & Ward, 1963) were used to determine whether the USAF/SAM tests and/or AFHRL data made an unique and significant contribution to the prediction of performance in medical technical training courses. Analysis was accomplished on both the total sample and each of the individual course samples. Due to the small number of student eliminees and the non-homogeneity of regression equations among the individual courses (see Table A1), cross-application of regression weights to another sample was not accomplished to determine the stability of the predictor composites.

Table 2. **List of Variables**

Variable Number	Variable Names	Type Variable	Description
Predictor Variables			
1	Deviation IQ Score	Continuous	Derived from Otis-Lennon Mental Ability Test; direct measure of scholastic success and general mental ability
2	WPM score	Continuous	Derived from Appraisal of Reading Versatility-Advanced Test; a word-per-minute rate of reading
3	COMP score	Continuous	Derived from Appraisal of Reading Versatility-Advanced Test; a measure of comprehension in reading ability
4	VOCAB score	Continuous	Derived from Word Clue Test; a measure of functional vocabulary
5	AFQT score	Continuous	Percentile score derived from the Armed Forces Qualification Test/ASVAB; a measure of general mental ability
6	Mechanical AI	Continuous	Percentile score derived from ASVAB subtests to form Mechanical Aptitude Index
7	Administrative AI	Continuous	Percentile score derived from ASVAB subtests to form Administrative Aptitude Index
8	General AI	Continuous	Percentile score derived from ASVAB subtests to form General Aptitude Index
9	Electronics AI	Continuous	Percentile score derived from ASVAB subtests to form Electronics Aptitude Index
10	Years of education	Continuous	Number of years of edcuation completed
11	AFSC Preferred	Categorical	Indicates whether trainee designated medical career field as preferred AFSC

Table 2 (*Continued*)

Variable Number	Variable Names	Type Variable	Description
12	GAFSC	Categorical	Indicates whether medical career field was a guaranteed AFSC for trainee
13	Biology	Categorical	Indicates whether trainee completed this course in high school
14	Chemistry		
15	Algebra		
16	General mathematics		
17	General science		
18	Geometry		
19	Physics		
20	Anatomy/physiology		
21	Age	Continuous	Age of student trainee at time of entry into training
22	TAFMS	Continuous	Number of years of total active military service at time of entry into training
Criterion Variables			
1	Pass/fail	Categorical	Final disposition from technical training
2	Test Grade I	Continuous	Numerical grade on first test in technical training course (Note: Students not taking first test assigned a grade of 0)
3	Final Average	Continuous	Score derived from summation of all test scores divided by the number of tests given in each course
4	Test Grades I and II	Continuous	Combined scores of Tests I and II divided by 2

III. RESULTS AND DISCUSSION

Three models were developed from the predictor variables. Model 1 contained the commercial tests administered by USAF/SAM and all aptitudinal and biographical data available from AFHRL files. Model 2 contained only the commercial tests used by USAF/SAM in their screening process. Model 3 was comprised of the data available from AFHRL files only.

Results of the first regression analysis indicated that all models, in the total sample and in the individual course samples, significantly predicted all criteria. The multiple correlations derived from the individual models are contained in Table 3. Means, standard deviations, and correlation matrices are contained in Tables A2 through A6 in Appendix A. Based on these findings, it appears that a combination of commercial test scores and AFHRL data or one of the components alone could be used effectively to predict probable success in technical training.

The next regression analysis investigated the possibility of eliminating the commercial tests from the predictor system (see Table 4). In developing a selection model for practical utility, it is necessary to consider potential savings which may result in identifying and rejecting potential eliminees, as well as the additional cost in time and money used in implementing the proposed screening system. Using three commercial tests in addition to the operational test and biographical data which are readily available on each trainee would increase the overall cost of an operational screening methodology. The use of AFHRL biographical and aptitudinal data alone would eliminate the administration of the three commercial tests, if such data were as effective as a composite which included the commercial tests.

A comparison of Models 1 and 3 indicated that the commercial tests added significantly to the experimental predictor composites in all samples with one exception. The commercial tests failed to make a unique and significant contribution to the prediction of final average in Course 91130, over and above the AFHRL biographical and aptitudinal data. Although the use of commercial tests represent an additional cost to the Air Force's

Table 3. **Multiple Correlations**

Sample	Model[a]	Pass/Fail	Test I	Tests I & II	FSQ
Total	1	.3525**	.4808**	.4731**	.4417**
	2	.3163**	.4345**	.4233**	.3930**
	3	.2659**	.4037**	.4085**	.3764**
90130	1	.3699**	.5491**	.5398**	.5075**
	2	.2690**	.4796**	.4601**	.4274**
	3	.3250**	.4897**	.4548**	.4891**
90730	1	.4923**	.6239**	.6383**	.6243**
	2	.4097**	.5741**	.5866**	.5713**
	3	.3899**	.5126**	.5385**	.5148**
91130	1	.3848**	.4275**	.4073**	.4084**
	2	.2955**	.3250**	.3047**	.2757**
	3	.3077*	.3856**	.3706**	.3833**

[a]Model 1 – contains commercial test scores, aptitudinal scores, and biographical data; predictor variables 1 – 22 (see Table 2).

Model 2 – contains commercial test scores only; predictor variables 1 – 4 (see Table 2).

Model 3 – contains aptitudinal scores and biographical data only; predictor variables 5 – 22 (see Table 2).

*Significant at .05 level.

**Significant at .01 level.

Table 4. Summary of Regression Analysis

Criterion	Comparison[a]	R^2 Full Model	R^2 Restricted Model	df_1	df_2	F
		Total Sample				
Pass/Fail	Model 1 vs 2	.1243	.1000	18	980	1.5050
	Model 1 vs 3	.1243	.0707	4	980	14.9847**
Test I	Model 1 vs 2	.2312	.1888	18	980	3.0059**
	Model 1 vs 3	.2312	.1629	4	980	21.7523**
Tests I & II	Model 1 vs 2	.2239	.1792	18	980	3.1328**
	Model 1 vs 3	.2239	.1668	4	980	18.0012**
Final Average	Model 1 vs 2	.1951	.1545	18	980	2.7473**
	Model 1 vs 3	.1951	.1417	4	980	16.2449**
		90130 Total Sample				
Pass/Fail	Model 1 vs 2	.1369	.0724	18	341	1.4152
	Model 1 vs 3	.1369	.1056	4	341	3.0853**
Test I	Model 1 vs 2	.3015	.2300	18	341	1.9382**
	Model 1 vs 3	.3015	.2399	4	341	7.5216**
Tests I & II	Model 1 vs 2	.2914	.2117	18	341	2.1295**
	Model 1 vs 3	.2914	.2392	4	341	6.2754**
Final Average	Model 1 vs 2	.2575	.1827	18	341	1.9090**
	Model 1 vs 3	.2575	.2068	4	341	5.8203**
		90730 Total Sample				
Pass/Fail	Model 1 vs 2	.2423	.1678	18	305	1.6655*
	Model 1 vs 3	.2423	.1520	4	305	9.0873**
Test I	Model 1 vs 2	.3892	.3296	18	305	1.6526*
	Model 1 vs 3	.3892	.2627	4	305	15.7914**
Tests I & II	Model 1 vs 2	.4075	.3440	18	305	1.8143*
	Model 1 vs 3	.4075	.2900	4	305	15.1201**
Final Average	Model 1 vs 2	.3898	.3263	18	305	1.7612*
	Model 1 vs 3	.3898	.2650	4	305	15.5909**
		91130 Total Sample				
Pass/Fail	Model 1 vs 2	.1481	.0873	18	288	1.1412
	Model 1 vs 3	.1481	.0947	4	288	4.5138**
Test I	Model 1 vs 2	.1827	.1057	18	288	1.5089
	Model 1 vs 3	.1827	.1487	4	288	3.0002*
Tests I & II	Model 1 vs 2	.1659	.0929	18	288	1.4003
	Model 1 vs 3	.1659	.1373	4	288	2.4650*
Final Average	Model 1 vs 2	.1668	.0760	18	288	1.7437*
	Model 1 vs 3	.1668	.1469	4	288	1.7178

[a]Model 1 – contains commercial test scores, aptitudinal scores and biographical data; predictor variables 1 – 22 (see Table 2).
Model 2 – contains commercial test scores only; predictor variables 1 – 4 (see Table 2).
Model 3 – contains aptitudinal scores and biographical data only; predictor variables 5 – 22 (see Table 2).

*Significant at .05 level.

**Significant at .01 level.

operational selection program, results indicate that eliminating these tests would significantly decrease the predictive accuracy of the selector composites.

Model 1 versus Model 2 comparisons indicated that the contribution of the AFHRL data, over and above the commercial tests, was not universally found to be significant. For the pass/fail criterion, only in Course 90730 did the AFHRL data make a unique and significant contribution. In the 91130 sample, these data added significantly only in the prediction of final average. Although the utility of the AFHRL data was not confirmed in every course with all criteria, it should be noted that such data (which are easily retrievable or accessible on every student trainee) can be used with little or no additional cost to the Air Force. Based on these findings, it appears that the most effective predictor composite for all criteria is Model 1, which contains both the commercial tests and AFHRL data. It is realized that the magnitude of the obtained multiple correlations for Model 1 will most likely decrease upon cross-application of regression weights to another sample; however, it should also be noted that the correlation obtained on a sample population previously screened by the ASVAB is somewhat lower than if it had been computed on an unrestricted population.

The use of this screening technique in identifying high-risk personnel for potential elimination from training is minimally effective. The relatively low attrition rate actually experienced in these medical courses makes identification of potential failures difficult. Using Model 1 selector composite, 16% of the eliminees in the total sample would have been correctly identified. For the individual course, the percentage of eliminees correctly identified varies between a low of 8% for the 90130 course to a high of 34% in the 90730 training program. It appears that the predictor composite can be used more advantageously in identifying personnel who might require remedial training. Remedial training is an integral part of the USAF/SAM medical training program, and identification of those individuals requiring additional academic instruction at an early stage in their training program should maximize the benefit to be derived from the remedial training received. An individual's potential in training can be assessed by using one or more of the grade criteria. Using the regression weights, shown in Tables 5 through 8, a trainee's probable need for remedial training can be estimated.

Table 5. **Regression Weights for Total Sample Model 1**

Variable Number	Biographical/Aptitudinal Information Variables	Regression Weights			
		Pass/Fail	Test I	Tests I & II	FSG
1	IQ	.004815	.331782	.269605	.243006
2	WPM	−.000005	.000377	−.000502	−.003699
3	Comprehension	.002340	.046064	.064137	.059578
4	Vocabulary	.001347	.802088	.589024	.557036
5	AFQT	.000261	.027838	.021773	.023169
6	Mechanical AI	.000410	.047730	.035129	.051630
7	Administrative AI	−.001051	−.027292	−.038142	−.025342
8	General AI	−.007200	−.000749	.037564	−.001203
9	Electronics AI	.000815	.018874	.059541	.027950
10	Years of Education	.011811	.969234	.940045	.514144
11	AFSC	.031318	1.394792	.801102	.474468
12	Guaranteed AFSC	.060458	3.745162	4.251912	4.277685
13	Biology	.000603	1.864761	1.067767	1.398997
14	Chemistry	−.007098	.627298	.573022	.574300
15	Algebra	.043998	1.109925	1.296278	1.351915
16	General Mathematics	.049632	−5.821246	−3.902253	−2.513692
17	General Science	−.074523	−2.403064	−3.445147	−2.818092
18	Geometry	.006833	.968783	.271117	.392890
19	Physics	−.029725	−1.028794	−1.551386	−1.735580
20	Anatomy/Physiology	−.000441	.761875	1.464730	1.336250
21	Age (at entry into Training)	.000432	.132763	.194523	.232112
22	TAFMS	.015591	1.216459	.663407	.529880
	Regression Constant	.058759	21.869978	25.804687	35.708523
	Optimal cutoff score	.670	70	140	70

Table 6. **Regression Weights for 90130 Sample**
Model 1

Variable Number	Biographical/Aptitudinal Information Variables	Regression Weights			
		Pass/Fail	Test I	Tests I & II	FSG
1	IQ	.002708	.304514	.245871	.193759
2	WPM	−.000066	−.003763	−.002561	−.006540
3	Comprehension	.001767	.016611	.053891	.059242
4	Vocabulary	.002415	.887130	.658003	.594975
5	AFQT	.002940	.144006	.122838	.118233
6	Mechanical AI	−.000501	.034632	−.000265	.046967
7	Administrative AI	−.001268	−.016858	−.012554	.022187
8	General AI	−.001507	−.000720	.055953	.023569
9	Electronics AI	−.000176	−.051755	−.004160	−.066210
10	Years of Education	.018581	1.461884	1.875780	1.467588
11	AFSC	.011339	.041430	−.923446	−1.545004
12	Guaranteed AFSC	.065012	5.260695	6.097409	4.936615
13	Biology	.018911	1.995940	−.641055	.026345
14	Chemistry	−.000899	−.756846	−.147915	.004344
15	Algebra	.052655	−.255625	1.851847	1.590552
16	General Mathematics	−.070627	−8.087654	−6.426204	−4.227193
17	General Science	−.056952	−1.839300	−1.958085	−1.367670
18	Geometry	.003967	2.286635	.457569	−.644020
19	Physics	−.045994	−2.429264	−2.704744	−3.343108
20	Anatomy/Physiology	−.017870	.008293	.084625	−.292544
21	Age (at entry to training)	−.008861	.137849	.067429	−.165318
22	TAFMS	.017315	1.020294	.969751	1.013875
	Regression Constant	.573707	25.589255	22.763109	39.703969
	Optimal cutoff score	.66	70	140	70

Table 7. **Regression Weights for 90730 Sample**
Model 1

Variable Number	Biographical/Aptitudinal Information Variables	Regression Weights			
		Pass/Fail	Test I	Tests I & II	FSG
1	IQ	.006900	.380632	.310632	.297676
2	WPM	.000333	.006462	.002545	.001651
3	Comprehension	.002793	.065369	.075093	.097133
4	Vocabulary	−.004890	.927117	.720326	.561385
5	AFQT	−.000087	−.057959	−.019770	−.001250
6	Mechanical AI	.000571	.041378	.044735	.031615
7	Administrative AI	−.001290	.016912	.010148	.005256
8	General AI	.002018	.045914	.052902	.020532
9	Electronics AI	.000570	.075472	.065280	.052584
10	Years of Education	.010199	.841830	.622495	.201634
11	AFSC	.041613	1.808472	1.259188	.754467
12	Guaranteed AFSC	.090567	.599688	1.208848	2.409496
13	Biology	−.121444	−.805640	−1.091829	−2.120280
14	Chemistry	−.003059	2.398907	2.091829	1.820382
15	Algebra	.064795	−2.272336	−2.540523	−2.342941
16	General Mathematics	.194584	−2.389616	.207007	1.944302
17	General Science	.010501	.896007	−1.263062	.192486
18	Geometry	−.049076	2.114715	1.481743	2.523088
19	Physics	.010243	1.108961	.960286	1.325478
20	Anatomy/Physiology	.013696	.302181	1.330794	2.122931
21	Age (at entry to training)	.009566	−.042622	.062474	.316671
22	TAFMS	.032579	1.283275	.730403	.625542
	Regression Constant	−.732827	10.902887	20.469578	20.846067
	Optimal cutoff score	.62	70	140	70

Table 9. **Personal Data Sheet**

Name _____

SSAN _____

Age _____

Years of Education _____

GAFSC _____

Preferred AFSC _____

TAMFS _____

Courses taken and completed in high school/college:

	YES	NO
Biology	_____	_____
Chemistry	_____	_____
Algebra	_____	_____
General Mathematics	_____	_____
General Science	_____	_____
Geometry	_____	_____
Physics	_____	_____
Anatomy/Physiology	_____	_____

Information from official records:

	Score
AFQT	_____
Mechanical AI	_____
Administrative AI	_____
General AI	_____
Electronics AI	_____
IQ Score	_____
WPM Score	_____
COMP Score	_____
VOCAB Score	_____

Table 8. **Regression Weights for 91130 Sample**
Model 1

Variable Number	Biographical/Aptitudinal Information Variables	Regression Weights			
		Pass/Fail	Test I	Tests I & II	FSG
1	IQ	.004942	.339540	.299281	.233872
2	WPM	−.000225	−.015677	−.009764	−.012164
3	Comprehension	.003033	.054308	.066217	.037083
4	Vocabulary	.006373	.335779	.072953	.327985
5	AFQT	−.003564	−.081901	−.108845	−.067659
6	Mechanical AI	.000872	.036443	.051558	.065460
7	Administrative AI	−.000743	−.092979	−.124164	−.125505
8	General AI	−.001499	.044589	.060461	−.006461
9	Electronics AI	.002985	.091383	.149712	.113984
10	Years of Education	−.013756	.518739	.211680	−.110429
11	AFSC	.058448	1.789524	1.600338	1.741433
12	Guaranteed AFSC	−.033454	−.899482	1.144463	3.538575
13	Biology	.100398	3.676947	4.304516	5.931903
14	Chemistry	−.021431	2.226087	.608380	1.580586
15	Algebra	.023007	7.788725	5.839147	6.385092
16	General Mathematics	.068029	−3.332660	−1.834028	−.894435
17	General Science	−.172185	−2.147659	−4.926422	−4.633101
18	Geometry	.076101	−3.196083	−1.955471	−1.515156
19	Physics	−.034083	−.264955	−1.327496	−1.806437
20	Anatomy/Physiology	.002073	3.910437	3.910437	2.972489
21	Age (at entry to training)	−.002466	−.251879	−.052699	.111829
22	TAFMS	.007603	2.596964	1.261755	1.014792
	Regression Constant	.468969	29.583905	35.803411	46.265853
	Optimal cutoff score	.560	70	140	70

In order to obtain predicted scores for any student entering training, Table 9 presents a personal data sheet which lists the biographical and aptitudinal data required for the actual computation of criterion scores.

Table 10 illustrates the computation of two trainees' predicted level of achievement on Test I in Course 90730. From these data, it would appear that Trainee A is a likely candidate to receive remedial training, since his predicted score on Test I fails to reach the minimally acceptable passing score of 70. If such training is made available during the early phase of his training program, the likelihood of his becoming an eliminee might be averted. Trainee B, on the other hand, is not identified as a candidate for remedial training. His predicted score exceeds the optimal cutoff score of 70. Based on his predicted score of 90, he would be identified as a probable graduate in the 90730 medical training program. If additional evidence on an individual's potential performance in training is desired, predicted scores for Tests I and II or final school grade may also be computed.

IV. CONCLUSIONS AND RECOMMENDATIONS

It appears that a predictor composite comprised of biographical and aptitudinal information can be used to identify potential failures and/or personnel requiring remedial training in medical technical training courses. The significant contribution of the commercial tests to the predictor composite warrants their being retained in the selection composite even though their use entails an additional expense to the Air Force in an operational testing program. Aptitudinal and biographical data on trainees which are available prior to entry into training can be used in conjunction with the commercial tests now being administered to trainees to improve the predictive accuracy of the selection composite.

Table 10. **Computation of Predicted Score on Test I for Course 90730**

Variable Number	Biographical/Aptitudinal Information Variables	Trainee A	Trainee B	Regression Weights
1	IQ	90	115	.380632
2	WPM	200	295	.006462
3	Comprehension	60	80	.065369
4	Vocabulary	3	6	.927117
5	AFQT	70	80	−.057959
6	Mechanical AI	70	70	.041378
7	Administrative AI	65	70	.016912
8	General AI	65	80	.045914
9	Electronics AI	65	85	.075472
10	Years of Education	12	13	.841830
11	AFSC	0	1	1.808472
12	Guaranteed AFSC	0	1	.599688
13	Biology	1	1	−.805640
14	Chemistry	0	1	2.398907
15	Algebra	1	1	−2.272336
16	General Mathematics	1	1	−2.398616
17	General Science	1	1	.896007
18	Geometry	0	1	2.114715
19	Physics	0	1	1.108961
20	Anatomy/Physiology	0	1	.302181
21	Age (at entry to training)	19	20	−.042622
22	TAFMS	0	0	1.283275
	Regression Constant	10.902887	10.902887	10.902887
	Predicted score	65.704915	90.758588	.....
	Optimal cutoff score	70.000000	70.000000	.....

Although this selection system could be used to identify personnel who are high-risk for elimination from the training program, it is believed that this prediction system could be used more effectively in identifying individuals who need to be placed in remedial training in an early phase of their technical training program.

It is recommended that if this selection composite should be used on an interim basis by USAF/SAM course managers, additional research should be initiated to determine the validity and stability of the selection composite on another sample.

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APPENDIX A: **STATISTICAL ANALYSES**

Table A1. Test for Homogeneity of Regression Equations

Criterion	R^2 Full Model[a]	R^2 Restricted Model[b]	df_1	df_2	F
Pass/Fail	.1807	.1243	46	934	1.3983*
Test I	.3027	.2312	46	934	2.0800**
Tests I & II	.2775	.2239	46	934	1.5061*
Final Average	.2648	.1951	46	934	1.9266**

[a]Full Model – separate equations by course: 90130, 90730, 91130.

[b]Restricted Model – common equation for all courses combined.

*Significant at .05 level.

**Significant at .01 level.

Table A2. **Means and Standard Deviations**

Variable Number	Variable Description	Total Sample Mean	Total Sample S.D.	Course 90130 Mean	Course 90130 S.D.	Course 90730 Mean	Course 90730 S.D.	Course 91130 Mean	Course 91130 S.D.
1	IQ Score	104.1057	11.8559	105.7335	11.7601	106.9116	11.7215	104.2184	12.0996
2	WPM Score	228.2841	67.8847	233.0912	70.3167	230.5915	69.8922	220.2899	61.9295
3	Comprehension Score	67.4770	18.7199	67.2527	19.3189	68.9451	17.9351	67.3433	18.7930
4	Vocabulary Score	3.1197	1.0508	3.0297	1.0699	3.3262	1.0829	2.9948	1.0046
5	AFQT Score	63.7159	18.1747	62.3187	19.1083	64.5122	18.0521	64.5113	17.0492
6	Mechanical AI	57.5952	20.7527	57.1094	19.9487	56.6220	22.2096	59.1961	19.9838
7	Administrative AI	59.8943	17.9508	60.3269	17.0118	59.9238	17.7055	59.3569	17.6716
8	General AI	73.2752	12.0677	72.0792	11.7388	73.3537	12.1300	74.5981	12.2370
9	Electronics AI	64.3320	17.6865	63.3379	17.1547	63.7195	18.2515	66.1415	17.5579
10	Years of Education	12.0189	.8867	12.0027	.9093	12.0671	.9411	11.9871	.7938
11	AFSC	.5005	.5000	.5522	.4973	.5366	.4987	.4019	.4903
12	Guaranteed AFSC	.1350	.3429	.1923	.3941	.1280	.3341	.0772	.2669
13	Biology	.8504	.3566	.8626	.3442	.8415	.3652	.8457	.3613
14	Chemistry	.9546	.9979	.9198	.9927	.9909	.9999	.9630	.9986
15	Algebra	.8335	.3725	.8269	.3783	.8232	.3815	.8521	.3550
16	General Mathematics	.9791	.1432	.9780	.1466	.9787	.1445	.9807	.1376
17	General Science	.9691	.1731	.9615	.1923	.9726	.1634	.9793	.1583
18	Geometry	.6451	.9785	.6429	.9792	.6433	.9790	.6495	.9771
19	Physics	.2109	.9076	.1978	.3983	.2139	.9097	.2219	.9155
20	Anatomy/Physiology	.1336	.3402	.1374	.3442	.1555	.3629	.1041	.3080
21	Age	20.6909	2.2171	20.6978	2.2537	21.0000	2.2279	20.3569	2.1121
22	TAFMS	.8305	1.2908	.8329	1.2911	.9268	1.3884	.7267	1.1701
23	Pass/Fail	.0957	.2942	.0719	.2575	.0974	.2967	.1222	.3275
24	Test Grade I	78.7139	15.3872	80.1071	14.0942	78.5549	13.7780	79.9100	17.9516
25	Final Average	80.7498	13.9316	83.2527	11.8816	80.1829	11.5049	78.9180	16.2947
26	Tests I and II Combined	80.1665	14.9573	82.3297	13.7117	80.3537	12.0181	77.9373	16.9997

Table A3. **Correlation Matrix – Total Sample**

Variable Number	Variable Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	IQ Score	1.0000	.9038	.9069	.6549	.5629	.9099	.9057	.5923	.5995	.1779	.0999	.0773	.0919	.2695	.2913
2	MPM Score	.9038	1.0000	.1011	.3720	.1693	.0911	.2635	.2199	.1390	.1195	.0281	-.0117	.1113	.1902	.1192
3	Comprehension Score	.9069	.1011	1.0000	.9163	.2923	.1995	.1031	.2592	.2519	.0537	-.0185	-.0100	.0316	.0973	.0918
4	Vocabulary Score	.6549	.3720	.9163	1.0000	.9077	.2777	.2980	.9256	.3589	.2929	.0737	.0305	.0955	.1977	.2113
5	AFQT Score	.5629	.1693	.2923	.9077	1.0000	.9668	.3281	.5090	.6782	.0639	.0531	.0929	-.0456	.1791	.1196
6	Mechanical AI	.9099	.0911	.1995	.2777	.9668	1.0000	.9095	.3846	.6380	.1303	-.0235	.0059	.0262	.1995	.1992
7	Administrative AI	.9057	.2635	.1031	.2980	.3281	.2095	1.0000	.9818	.3599	.1759	.0671	.0715	.0936	.1673	.2289
8	General AI	.5923	.2199	.2592	.9256	.5090	.3846	.9818	1.0000	.5707	.1949	.1144	.1278	.0930	.2939	.2810
9	Electronics AI	.5995	.1390	.2519	.3589	.6782	.6380	.3599	.5707	1.0000	.1219	.0130	.0808	.0181	.2162	.2086
10	Years of Educatio	.1779	.1195	.0537	.2929	.0639	.1303	.1759	.1949	.1219	1.0000	.0978	.0080	.1855	.2605	.1997
11	AFSC	.0999	.0281	-.0185	.0737	.0531	-.0235	.0671	.1144	.0130	.0978	1.0000	.3607	.1067	.1032	.1530
12	Guaranteed AFSC	.0773	-.0117	-.0100	.0305	.0929	.0059	.0715	.1278	.0808	.0080	.3607	1.0000	.0191	.0010	.0988
13	Biology	.0919	.1113	.0316	.0955	-.0456	.0262	.0936	.0930	.0181	.1855	.1067	.0191	1.0000	.2537	.2703
14	Chemistry	.2695	.1907	.0973	.1977	.1791	.1995	.1673	.2939	.2162	.2605	.1032	.0010	.2537	1.0000	.3328
15	Algebra	.2913	.1192	.0918	.2113	.1196	.1992	.2289	.2810	.2086	.1997	.1530	.0988	.2703	.3328	1.0000
16	General Mathematics	.0759	.0291	-.0199	-.0298	-.0203	-.0490	-.0548	.0229	-.0119	.0817	.0767	-.0239	.1925	.1055	.1590
17	General Science	-.0261	.0465	-.0099	.0017	-.0231	-.0901	-.0193	-.0090	-.0133	.0928	.0905	-.0807	.1513	.0889	.1676
18	Geometry	.3297	.1169	.1250	.2238	.1229	.1905	.2779	.3682	.2971	.2226	.0883	.0747	.2557	.4262	.5969
19	Physics	.1937	.0539	.0390	.1213	.1118	.1929	.1615	.2481	.2595	.2097	.0166	-.0329	.1067	.3786	.1782
20	Anatomy/Physiology	.0548	.0473	.0049	.0881	.0290	.0513	.0188	.0883	.0770	.1569	.1961	.0670	.1159	.2004	.0968
21	Age	-.0981	.0009	-.0007	.1029	-.0254	.0539	.0988	-.0617	-.0209	.2999	-.0763	-.1300	-.0299	.0108	-.0587
22	TAFMS	-.0849	.0892	-.0439	.0086	-.1173	.0145	-.0282	-.2201	-.0971	-.1009	-.2089	-.1696	-.0986	-.0833	-.1126
23	Pass/Fail	-.2895	-.0918	-.2402	-.2197	-.1780	-.1591	-.0679	-.1987	-.1908	-.0757	-.0749	-.0992	-.0396	-.0729	-.1275
24	Test Grade I	.9168	.1703	.2295	.3597	.2669	.2590	.1771	.2593	.2791	.1519	.0842	.1164	.0909	.1893	.1713
25	Final Average	.3729	.1258	.2347	.3159	.2595	.2500	.1986	.2919	.2731	.1295	.0715	.1360	.0759	.1384	.1579
26	Tests I and II Combined	.9039	.1999	.2478	.3419	.2811	.2585	.1859	.2828	.3085	.1498	.0810	.1366	.0696	.1515	.1638

Table A3 (*Continued*)

Variable Number	Variable Description	16	17	18	19	20	21	22	23	24	25	26
1	IQ Score	.0259	-.0261	.3297	.1937	.0598	-.0981	-.0869	-.2845	.9168	.3729	.9039
2	WPM Score	.0291	.0665	.1169	.0539	.0473	.0009	.0042	-.0918	.1703	.1258	.1499
3	Comprehension Score	-.0199	-.0099	.1250	.0340	.0099	-.0007	-.0439	-.2403	.2295	.2347	.2478
4	Vocabulary Score	-.0248	.0017	.2238	.1213	.0581	.1029	.0084	-.2197	.3597	.3159	.3419
5	AFQT Score	-.0203	-.0231	.1229	.1118	.0290	-.0259	-.1173	-.1780	.2069	.2545	.2811
6	Mechanical AI	-.0690	-.0401	.1905	.1924	.0513	.0539	.0195	-.1591	.2540	.2500	.2585
7	Administrative AI	-.0548	-.0193	.2779	.1615	.0158	.0488	-.0282	-.0479	.1771	.1986	.1859
8	General AI	.0224	-.0090	.3602	.2481	.0853	-.0617	-.2201	-.1487	.2593	.2419	.2828
9	Electronics AI	-.0119	-.0133	.2971	.2595	.0770	-.0209	-.0971	-.1908	.2791	.2731	.3085
10	Years of Education	.0817	.0928	.2226	.2097	.1569	.2499	-.1009	-.0757	.1519	.1295	.1498
11	AFSC	.0767	.0905	.0883	.0144	.1961	-.0763	-.2084	-.0749	.0842	.0715	.0810
12	Guaranteed AFSC	-.0234	-.0807	.0747	-.0329	.0670	-.1300	-.1496	-.0992	.1154	.1360	.1364
13	Biology	.1925	.1513	.2557	.1047	.1154	-.0245	-.0484	-.0346	.0909	.0759	.0696
14	Chemistry	.1055	.0589	.9267	.3784	.2004	.0108	-.0833	-.0729	.1597	.1389	.1515
15	Algebra	.1596	.1674	.5969	.1783	.0968	-.0587	-.1124	-.1275	.1712	.1579	.1638
16	General Mathematics	1.0000	.5372	.1389	.0755	.0574	-.1523	-.2080	.0002	-.0692	-.0489	-.0600
17	General Science	.5372	1.0000	.0963	.0074	.0361	-.0873	-.1038	.0385	-.0655	-.0621	-.0725
18	Geometry	.1389	.0963	1.0000	.2908	.1014	-.0301	-.0958	-.1128	.1865	.1607	.1700
19	Physics	.0755	.0074	.2908	1.0000	.1281	.0786	-.0478	-.0183	.0826	.0521	.0717
20	Anatomy/Physiology	.0574	.0361	.1014	.1281	1.0000	.0561	-.0370	-.0281	.0703	.0784	.0855
21	Age	-.1523	-.0873	-.0301	.0786	.0561	1.0000	.9882	-.0158	.0730	.0565	.0564
22	TAFMS	-.2080	-.1038	-.0958	-.0478	-.0370	.9882	1.0000	-.0177	.0599	.0195	.0140
23	Pass/Fail	.0002	.0385	-.1128	-.0183	-.0281	-.0158	-.0177	1.0000	-.5417	-.6537	-.6156
24	Test Grade I	-.0692	-.0655	.1865	.0826	.0703	.0730	.0599	-.5417	1.0000	.8911	.9247
25	Final Average	-.0489	-.0621	.1607	.0521	.0784	.0565	.0195	-.6537	.8911	1.0000	.9491
26	Tests I and II Combined	-.0600	-.0725	.1700	.0717	.0855	.0564	.0140	-.6156	.9247	.9491	1.0000

Table A4. Correlation Matrix – Course 90130

Variable Number	Variable Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	IQ Score	1.0000	.9616	.3884	.6502	.5248	.9272	.9097	.5126	.5111	.1696	.0656	.0733	.1219	.2083	.2360
2	WPM Score	.9616	1.0000	.0748	.3806	.1929	.1733	.2718	.2964	.1884	.1094	.0320	-.0117	.1284	.1518	.1311
3	Comprehension Score	.3884	.0748	1.0000	.3852	.2284	.1332	.1157	.2559	.2627	.0020	.0121	.0117	.0878	.0995	.0327
4	Vocabulary Score	.6502	.3806	.3852	1.0000	.9930	.3130	.3011	.9243	.3811	.2552	.0949	.0947	.0906	.1491	.1808
5	AFQT Score	.5248	.1929	.2284	.9930	1.0000	.9259	.3261	.9691	.6196	.0971	.0659	.1068	-.0978	.1059	.0863
6	Mechanical AI	.9272	.1733	.1332	.3130	.9259	1.0000	.1841	.9075	.6098	.1277	-.0366	.0516	.0121	.1977	.1283
7	Administrative AI	.9097	.2718	.1157	.3011	.3261	.1841	1.0000	.5119	.3935	.1947	.0547	.0312	.0147	.1903	.1838
8	General AI	.5126	.2964	.2559	.9243	.9691	.9075	.5119	1.0000	.5727	.1861	.1149	.1890	.0773	.2597	.2231
9	Electronics AI	.5111	.1884	.2627	.3811	.6196	.6098	.3935	.5727	1.0000	.1965	.0657	.1692	.0334	.2165	.1800
10	Years of Education	.1696	.1094	.0020	.2552	.0971	.1277	.1947	.1861	.1965	1.0000	.0999	.0062	.1767	.2550	.1930
11	AFSC	.0656	.0320	.0121	.0949	.0659	-.0366	.0547	.1149	.0657	.0999	1.0000	.3693	.1382	.1639	.2160
12	Guaranteed AFSC	.0733	-.0117	.0117	.0947	.1068	.0516	.0312	.1890	.1692	.0062	.3693	1.0000	.0530	-.0147	.1127
13	Biology	.1219	.1284	.0878	.0906	-.0978	.0121	.0147	.0773	.0334	.1767	.1382	.0530	1.0000	.2226	.2815
14	Chemistry	.2083	.1518	.0995	.1491	.1059	.1977	.1903	.2597	.2165	.2550	.1639	-.0147	.2226	1.0000	.2820
15	Algebra	.2360	.1311	.0327	.1808	.0863	.1283	.1838	.2231	.1800	.1930	.2160	.1127	.2815	.2820	1.0000
16	General Mathematics	.0125	.0951	-.0691	-.2080	-.0377	-.1063	-.0577	.0265	-.0918	.0917	.1288	-.0219	.2668	.0882	.2286
17	General Science	-.0021	.0771	-.0359	.0179	.0153	-.0469	.0206	.0658	.0014	-.0308	.0785	-.0836	.1692	.1109	.2989
18	Geometry	.3068	.0956	.1759	.2337	.0943	.2511	.2452	.3369	.2269	.2227	.1249	.0582	.3022	.4181	.5986
19	Physics	.1168	.0653	.0278	.0156	.0206	.2109	.1587	.1590	.1989	.2336	.1009	-.0673	.1180	.4078	.1543
20	Anatomy/Physiology	.0572	.0556	.0237	.0972	.0276	.0659	.0228	.0655	.0898	.2099	.0705	.0280	.1361	.2472	.0982
21	Age	-.0052	.0015	.0535	.1856	.0572	.0787	.0612	.0309	.0979	.1859	-.1085	-.1573	-.1031	.0689	-.1032
22	TAFMS	-.0409	.0477	.0445	.0757	-.1450	-.0198	-.0429	-.1991	-.0721	-.2196	-.2025	-.2179	-.0023	.0056	-.0988
23	Pass/Fail	-.2305	-.0625	-.2090	-.1919	-.2363	-.0827	-.0179	-.0854	-.0572	-.0360	-.0720	-.1353	-.0943	-.0170	-.0587
24	Test Grade I	.9515	.1860	.2249	.9109	.3673	.2652	.1876	.2797	.2917	.1529	.0623	.1720	.0729	.0797	.1219
25	Final Average	.3942	.1453	.2450	.3629	.3494	.2376	.1888	.2607	.2594	.1179	.0001	.1456	.0145	.0495	.0990
26	Tests I and II Combined	.4298	.1736	.2519	.3906	.2675	.2387	.2028	.3107	.3187	.1647	.0490	.1998	.0207	.0826	.1349

Table A4 (*Continued*)

Variable Number	Variable Description	16	17	18	19	20	21	22	23	24	25	26
1	IQ Score	.0125	-.0021	.3048	.1168	.0572	-.0052	-.0409	-.2305	.4515	.3942	.4298
2	MPM Score	.0451	.0771	.0954	.0653	.0556	.0015	.0477	-.0625	.1860	.1453	.1736
3	Comprehension Score	-.0601	-.0358	.1759	.0278	.0237	.0535	.0465	-.2090	.2299	.2450	.2518
4	Vocabulary Score	-.0080	.0179	.2337	.0154	.0972	.1856	.0757	-.1919	.4109	.3629	.3906
5	[illegible]	-.0377	.0153	.0943	.0204	.0276	.0572	-.1450	-.2363	.3673	.3999	.3675
6	[illegible]hanical AI	-.1063	-.0969	.2511	.2109	.0659	.0787	-.0198	-.0827	.2652	.2376	.2387
7	[illegible]ministrative AI	-.0577	.0206	.2452	.1587	.0228	.0612	-.0424	-.0179	.1876	.1888	.2028
8	General AI	.0265	.0658	.3368	.1590	.0655	.0309	-.1991	-.0859	.2797	.2607	.3107
9	Electronics AI	-.0918	.0019	.2269	.1989	.0898	.0979	-.0721	-.1972	.2917	.2599	.3187
10	Years of Education	.0917	-.0308	.2229	.2336	.2094	.1859	-.2196	-.0360	.1529	.1179	.1647
11	AFSC	.1288	.0785	.1299	.1009	.0705	-.1085	-.2025	-.0720	.0623	.0001	.0490
12	Guaranteed AFSC	-.0219	-.0634	.0582	-.0673	.0280	-.1573	-.2179	-.1353	.1720	.1654	.1998
13	Biology	.2668	.1692	.3022	.1180	.1361	-.1031	-.0023	-.0993	.0729	.0195	.0207
14	Chemistry	.0882	.1109	.4181	.4078	.2472	.0689	.0056	-.0170	.0797	.0995	.0826
15	Algebra	.2286	.2484	.5984	.1593	.0982	-.1032	-.0988	-.0987	.1219	.0990	.1349
16	General Mathematics	1.0000	.5547	.1229	.0744	.0598	-.1947	-.0775	.0416	-.1043	-.0930	-.1003
17	General Science	.5547	1.0000	.1193	.0276	.0798	-.1663	-.0923	.0555	-.0890	-.0763	-.0848
18	Geometry	.1229	.1193	1.0000	.2262	.0476	-.0139	-.0394	-.0427	.1943	.1186	.1655
19	Physics	.0744	.0276	.2262	1.0000	.2026	.1125	-.0157	.0765	-.0215	-.0785	-.0280
20	Anatomy/Physiology	.0598	.0798	.0476	.2026	1.0000	.1173	.0456	.0133	.0913	.0170	.0451
21	Age	-.1947	-.1663	-.0139	.1125	.1173	1.0000	.4792	.0372	.0995	.0555	.0887
22	TAFMS	-.0775	-.0923	-.0394	-.0157	.0456	.4792	1.0000	.0030	.0337	.0250	.0093
23	Pass/Fail	.0416	.0555	-.0827	.0765	.0133	.0372	.0030	1.0000	-.5391	-.6586	-.6236
24	Test Grade I	-.1043	-.0890	.1943	-.0215	.0913	.0995	.0337	-.5391	1.0000	.8969	.9095
25	Final Average	-.0930	-.0763	.1186	-.0785	.0170	.0555	.0250	-.6586	.8969	1.0000	.9422
26	Tests I and II Combined	-.1003	-.0848	.1655	-.0280	.0451	.0887	.0093	-.6236	.9095	.9422	1.0000

Table A5. **Correlation Matrix – Course 90730**

Variable Number	Variable Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	IQ Score	1.0000	.3259	.4227	.6405	.5730	.3982	.3974	.5618	.5679	.1832	.0603	.0859	.0266	.2657	.2672
2	WPM Score	.3259	1.0000	.0844	.3111	.0946	.0233	.2380	.1872	.0561	.1286	.0188	-.0359	.0969	.1248	.0710
3	Comprehension Score	.4227	.0844	1.0000	.4589	.2016	.1829	.1149	.2490	.2631	.0748	-.0158	-.0482	-.0423	.0953	.0979
4	Vocabulary Score	.6405	.3111	.4589	1.0000	.3353	.2012	.2772	.4037	.2950	.2340	.0745	.0359	.0859	.2056	.1746
5	AFQT Score	.5730	.0946	.2016	.3353	1.0000	.5211	.3019	.5221	.7233	.1055	.0969	-.0200	-.0473	.1939	.1079
6	Mechanical AI	.3982	.0233	.1829	.2012	.5211	1.0000	.1822	.3769	.7037	.1341	-.0918	-.0958	-.0435	.1826	.1490
7	Administrative AI	.3974	.2380	.1149	.2772	.3019	.1822	1.0000	.4917	.3176	.1918	.1065	.0996	.1184	.1179	.2327
8	General AI	.5618	.1872	.2490	.4037	.5221	.3769	.4917	1.0000	.5788	.2353	.1259	.0746	.1303	.2942	.2533
9	Electronics AI	.5679	.0561	.2631	.2950	.7233	.7037	.3176	.5788	1.0000	.0809	-.0016	-.0231	-.0942	.2226	.1973
10	Years of Education	.1832	.1286	.0748	.2340	.1055	.1341	.1918	.2353	.0809	1.0000	.0597	-.0079	.1817	.2735	.2028
11	AFSC	.0603	.0188	-.0158	.0745	.0969	-.0918	.1065	.1259	-.0016	.0597	1.0000	.3561	.1323	.1175	.1302
12	Guaranteed AFSC	.0859	-.0359	-.0482	.0359	-.0200	-.0958	.0996	.0746	-.0231	-.0079	.3561	1.0000	.0919	.0618	.1059
13	Biology	.0266	.0969	-.0423	.0859	-.0473	-.0435	.1184	.1303	-.0942	.1817	.1323	.0919	1.0000	.3093	.3020
14	Chemistry	.2657	.1248	.0953	.2056	.1939	.1826	.1179	.2942	.2226	.2735	.1175	.0618	.3093	1.0000	.3752
15	Algebra	.2672	.0710	.0979	.1765	.1079	.1490	.2327	.2533	.1973	.2028	.1302	.1059	.3020	.3752	1.0000
16	General Mathematics	-.0380	.0164	-.0010	-.0879	-.0496	-.0510	-.0483	.0495	-.0109	.1002	.1166	.0566	.2825	.1950	.2080
17	General Science	-.0546	.0902	-.0042	-.0208	-.0604	.0165	-.0060	.0003	-.0067	.0913	.0685	-.0473	.2337	.0529	.1647
18	Geometry	.3042	.1185	.1022	.1586	.1540	.2000	.3221	.3659	.2703	.2086	.0993	.0949	.2692	.4001	.6224
19	Physics	.1809	-.0055	-.0005	.1372	.1287	.1463	.1746	.3375	.2465	.2317	.0513	.0231	.1242	.3519	.2219
20	Anatomy/Physiology	.0280	.0168	-.0332	.0561	-.0285	-.0575	-.0195	.0682	.0029	.1482	.2132	.0622	.1907	.1846	.0884
21	Age	-.0984	-.0728	-.0420	.0251	-.0726	.0001	.0143	-.1072	-.0731	.2952	-.1400	-.1438	-.0525	-.0520	-.1009
22	TAFMS	-.1291	-.0530	-.1086	-.0547	-.1282	.0615	-.0021	-.2099	-.1132	-.0102	-.2780	-.1709	-.1251	-.1049	-.1338
23	Pass/Fail	-.3850	-.1990	-.2864	-.2686	-.2302	-.2137	-.1176	-.2939	-.2612	-.1217	-.0653	-.0953	.1196	-.0968	-.1169
24	Test Grade I	.6558	.2117	.3165	.4563	.3216	.3232	.2857	.3942	.3933	.2094	.0725	.0955	.0338	.2690	.1797
25	Final Average	.6493	.1651	.3586	.4321	.3523	.3210	.2589	.3671	.4111	.1850	.0700	.0851	-.0098	.2569	.1630
26	Tests I and II Combined	.6683	.1873	.3420	.4559	.3684	.3495	.2777	.4215	.4321	.2077	.0787	.0616	.0190	.2828	.1893

Table A5 (*Continued*)

Variable Number	Variable Description	16	17	18	19	20	21	22	23	24	25	26
1	IQ Score	-.0380	-.0546	.3042	.1809	.0280	-.0984	-.1291	-.3850	.5558	.5493	.5683
2	WPM Score	.0169	.0902	.1185	-.0055	.0168	-.0728	-.0530	-.1990	.2117	.1651	.1873
3	Comprehension Score	-.0010	-.0042	.1022	-.0005	-.0332	-.0420	-.1086	-.2846	.3165	.3586	.3420
4	Vocabulary Score	-.0879	-.0208	.1586	.1372	.0561	.0251	-.0547	-.2686	.4563	.4321	.4559
5	AFQT Score	-.0496	-.0609	.1590	.1287	-.0285	-.0726	-.1282	-.2302	.3218	.3523	.3689
6	Mechanical AI	-.0510	.0165	.2000	.1463	-.0575	.0001	.0615	-.2137	.3232	.3210	.3495
7	Administrative AI	-.0983	-.0060	.3221	.1746	-.0195	.0193	-.0021	-.1176	.2857	.2580	.2777
8	General AI	.0495	.0003	.3659	.3375	.0652	-.1072	-.2099	-.2434	.3942	.3871	.4215
9	Electronics AI	-.0109	-.0067	.2703	.2465	.0029	-.0731	-.1132	-.2612	.3933	.4111	.4321
10	Years of Education	.1002	.0913	.2086	.2317	.1482	.2952	-.0102	-.1217	.2099	.1850	.2077
11	AFSC	.1164	.0685	.0993	.0513	.2132	-.1400	-.2780	-.0653	.0725	.0700	.0787
12	Guaranteed AFSC	.0566	-.0473	.0949	.0231	.0622	-.1638	-.1709	-.0983	.0955	.0851	.0616
13	Biology	.2825	.2337	.2692	.1242	.1402	-.0525	-.1251	.1196	.0338	-.0098	.0190
14	Chemistry	.1450	.0529	.4001	.3519	.1846	-.0520	-.1069	-.0968	.2690	.2569	.2828
15	Algebra	.2080	.1667	.6229	.2219	.0886	-.1009	-.1338	-.1169	.1747	.1630	.1593
16	General Mathematics	1.0000	.6209	.1593	.0769	.0439	-.1231	-.3117	-.0225	-.0584	-.0178	-.0431
17	General Science	.6209	1.0000	.0697	-.0036	.0206	-.0919	-.1298	-.0077	-.0325	-.0282	-.0479
18	Geometry	.1593	.0697	1.0000	.3257	.0561	-.0571	-.1401	-.0769	.2550	.2408	.2455
19	Physics	.0769	-.0036	.3257	1.0000	.0845	.0200	-.0851	-.0710	.1929	.1980	.2008
20	Anatomy/Physiology	.0439	.0206	.0561	.0845	1.0000	.0453	-.0865	-.0277	.0474	.0934	.0777
21	Age	-.1231	-.0919	-.0571	.0200	.0453	1.0000	.5135	-.0738	.0268	.0482	.0171
22	TAFMS	-.3117	-.1298	-.1401	-.0851	-.0865	.5135	1.0000	-.0491	.0339	-.0079	-.0112
23	Pass/Fail	-.0225	-.0077	-.0769	-.0710	-.0277	-.0738	-.0491	1.0000	-.4711	-.5719	-.5019
24	Test Grade I	-.0584	-.0325	.2550	.1929	.0474	.0268	.0339	-.4711	1.0000	.8573	.9246
25	Final Average	-.0178	-.0282	.2408	.1980	.0934	.0482	-.0079	-.5719	.8573	1.0000	.9400
26	Tests I and II Combined	-.0431	-.0479	.2455	.2008	.0777	.0171	-.0112	-.5019	.9246	.9400	1.0000

Table A6. **Correlation Matrix – Course 91130**

Variable Number	Variable Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	IQ Score	1.0000	.9302	.9119	.6793	.6029	.9062	.9117	.5575	.5609	.1832	.0085	.0919	.1291	.3399	.3665
2	MPM Score	.9302	1.0000	.1562	.9357	.2928	.0881	.2823	.2362	.1830	.1185	-.0028	-.0228	.1055	.1539	.1753
3	Comprehension Score	.9119	.1562	1.0000	.9098	.3037	.2872	.0777	.2813	.2328	.0969	-.0630	.0021	.0943	.0925	.1632
4	Vocabulary Score	.6793	.9357	.9098	1.0000	.9931	.3929	.3197	.9915	.9178	.2309	.0958	.0739	.1175	.2801	.3001
5	AFQT Score	.6029	.2928	.3037	.9931	1.0000	.9593	.3688	.5492	.7128	.0321	.0614	.0901	-.0920	.1163	.1607
6	Mechanical AI	.9062	.0881	.2872	.3929	.9593	1.0000	.2587	.3711	.5933	.1367	.0953	.0991	.1253	.2295	.1532
7	Administrative AI	.9117	.2823	.0777	.3197	.3688	.2587	1.0000	.9508	.3412	.1965	.0317	.0958	.1507	.2016	.2821
8	General AI	.5575	.2362	.2813	.9915	.5492	.3711	.9508	1.0000	.5536	.1499	.1475	.1670	.0749	.3256	.3784
9	Electronics AI	.5609	.1830	.2328	.9178	.7128	.5933	.3412	.5536	1.0000	.1510	-.0010	.1185	.0739	.2077	.2515
10	Years of Education	.1832	.1185	.0969	.2309	.0321	.1367	.1965	.1499	.1510	1.0000	.1372	.0350	.2041	.2506	.2100
11	AFSC	.0085	-.0028	-.0630	.0958	.0614	.0953	.0317	.1475	-.0010	.1372	1.0000	.3282	.0916	.0279	.1199
12	Guaranteed AFSC	.0919	-.0228	.0021	.0739	.0901	.0991	.0958	.1670	.1185	.0350	.3282	1.0000	-.0766	-.0269	.0865
13	Biology	.1291	.1055	.0943	.1175	-.0920	.1253	.1507	.0749	.0739	.2041	.0916	-.0766	1.0000	.2361	.2231
14	Chemistry	.3399	.1539	.0925	.2801	.1163	.2295	.2016	.3256	.2077	.2506	.0279	-.0269	.2361	1.0000	.3506
15	Algebra	.3665	.1753	.1632	.3001	.1607	.1532	.2821	.3784	.2515	.2100	.1199	.0865	.2231	.3506	1.0000
16	General Mathematics	.1088	.0252	.0301	.0256	.0371	-.0966	-.0580	-.0192	.0229	.1155	-.0281	-.1396	.0098	.0839	.0079
17	General Science	-.0323	.0910	.0209	-.0003	-.0987	-.1031	-.0691	-.1132	-.0973	.0997	-.0325	-.1052	.0930	-.0120	.0967
18	Geometry	.3666	.1971	.0870	.2859	.1260	.1087	.2688	.3839	.2954	.2928	.0384	.0862	.1898	.4669	.5672
19	Physics	.2898	.1199	.0749	.2280	.2050	.2298	.1530	.2989	.3377	.1549	-.1063	-.0389	.0782	.3733	.1571
20	Anatomy/Physiology	.0899	.0633	.0206	.1096	.0901	.1941	.0980	.1478	.1709	.0895	.1939	.1351	.0605	.1616	.1191
21	Age	-.0995	.0658	-.0369	.0601	-.0856	.1115	.0686	-.1077	-.0227	.2732	-.0112	-.0779	.1017	.0018	.0618
22	TAFMS	-.0996	.0069	-.0927	-.0156	-.0649	.0050	-.0966	-.2558	-.0975	-.0696	-.1616	-.0869	-.0085	-.1749	-.0973
23	Pass/Fail	-.2487	-.0541	-.2350	-.2059	-.0893	-.1890	-.0619	-.1362	-.1780	-.0682	-.0685	-.0343	-.1667	-.1102	-.1769
24	Test Grade I	.3089	.0877	.1827	.2560	.1468	.2291	.0767	.1980	.2256	.1072	.0561	.0381	.1508	.1779	.2480
25	Final Average	.2569	.0569	.1553	.2199	.1375	.2369	.0390	.1689	.2212	.0919	.0960	.1053	.1663	.1879	.2309
26	Tests I and II Combined	.2868	.0795	.1896	.2266	.1616	.2391	.0977	.2040	.2491	.0931	.0711	.0783	.1987	.1909	.2196

Table A6 (*Continued*)

Variable Number	Variable Description	16	17	18	19	20	21	22	23	24	25	26
1	IQ Score	.1088	-.0321	.3666	.2498	.0844	-.0495	-.0946	-.2487	.3089	.2569	.2868
2	WPM Score	.0252	.0910	.1471	.1144	.0633	.0658	.0069	-.0541	.0877	.0569	.0745
3	Comprehension Score	.0301	.0209	.0870	.0749	.0206	-.0359	-.0927	-.2350	.1827	.1553	.1896
4	Vocabulary Score	.0256	-.0003	.2859	.2280	.1046	.0601	-.0156	-.2059	.2560	.2149	.2264
5	AFQT Score	.0371	-.0487	.1260	.2050	.0901	-.0856	-.0649	-.0843	.1668	.1375	.1616
6	Mechanical AI	-.0966	-.1031	.1087	.2248	.1941	.1115	.0050	-.1890	.2291	.2369	.2391
7	Administrative AI	-.0580	-.0691	.2688	.1530	.0480	.0686	-.0966	-.0619	.0767	.0340	.0477
8	General AI	-.0192	-.1132	.3634	.2984	.1478	-.1077	-.2558	-.1362	.1950	.1689	.2040
9	Electronics AI	.0229	-.0973	.2954	.3377	.1709	-.0227	-.0975	-.1780	.2256	.2212	.2491
10	Years of Education	.1155	.0997	.2928	.1549	.0845	.2732	-.0696	-.0682	.1072	.0919	.0931
11	AFSC	-.0281	-.0325	.0386	-.1063	.1939	-.0112	-.1616	-.0655	.0561	.0960	.0711
12	Guaranteed AFSC	-.1346	-.1052	.0862	-.0389	.1351	-.0774	-.0869	-.0393	.0381	.1053	.0783
13	Biology	.0048	.0930	.1898	.0782	.0605	.1017	-.0085	-.1667	.1508	.1863	.1987
14	Chemistry	.0839	-.0120	.3659	.3733	.1616	.0018	-.1749	-.1102	.1779	.1579	.1909
15	Algebra	.0079	.0967	.5672	.1571	.1191	.0618	-.0973	-.1769	.2980	.2309	.2196
16	General Mathematics	1.0000	.9202	.1419	.0749	.0483	-.1312	-.2525	-.0190	-.0449	-.0338	-.0335
17	General Science	.9202	1.0000	.0935	-.0110	-.0100	-.0206	-.0900	.0404	-.0555	-.0658	-.0711
18	Geometry	.1419	.0935	1.0000	.3279	.2312	-.0195	-.1198	-.1786	.1379	.1342	.1291
19	Physics	.0749	-.0110	.3279	1.0000	.0929	.1076	-.0906	-.0579	.1093	.0699	.0796
20	Anatomy/Physiology	.0483	-.0100	.2312	.0929	1.0000	-.0389	-.0980	-.0698	.1095	.1203	.1263
21	Age	-.1312	-.0206	-.0195	.1076	-.0389	1.0000	.9589	.0020	.0405	.0517	.0326
22	TAFMS	-.2525	-.0900	-.1198	-.0906	-.0980	.9589	1.0000	.0200	.1010	.0309	.0270
23	Pass/Fail	-.0190	.0404	-.1786	-.0579	-.0698	.0020	.0200	1.0000	-.5999	-.7107	-.6913
24	Test Grade I	-.0449	-.0555	.1379	.1093	.1095	.0405	.1010	-.5999	1.0000	.9051	.9375
25	Final Average	-.0338	-.0658	.1342	.0699	.1203	.0517	.0309	-.7107	.9051	1.0000	.9601
26	Tests I and II Combined	-.0335	-.0711	.1291	.0796	.1263	.0326	.0270	-.6913	.9375	.9601	1.0000

27 ☆ U.S. GOVERNMENT PRINTING OFFICE: 1977—771-122/74